

REMARKS

The application has received the office action of January 28, 2004 wherein the office rejected claims 1-25.

Independent claim 1 and it's dependent claims 3, 4, 5, 6, 7 and 9; independent claim 10 and it's dependent claims 11, 12, 13, 14 and 15 and independent claim 17 and it's dependent claims 21, 23 and 24 were rejected under 35 U.S.C. 102b as being anticipated by Glezer et al. 823.

The dependent claims 2, 8 and 16 (of claim 1) and the dependent claims 18 and 22 (of independent claim 17) were rejected as being unpatentable under 35 U.S.C. 103(a) as being unpatentable by Glezer et al. 823.

Dependent claim 5 (of independent claim 1) and independent claim 10, and it's dependent claim 20 were rejected under 35 U.S.C. 103(a) as being unpatentable over Glezer et al. 823 in view of Fusaro, Jr. et al.

The remaining dependent claims 19 and 25 (of independent claim 17) were rejected under 35 U.S.C. 103(a) as being unpatentable over Glezer et al. 823 in view of Rhyne et al.

Claim 11 was objected to because the drawings did not show concentrically arranged apertures.

The rejection of independent claim 1 and dependent claims 3,4,5,6,7 and 9;and independent claim 17 and dependent claims 21, 23 and 24 under 35 U.S.C. 102b as being anticipated by Glezer et al. 823.

It is submitted that the 102(b) rejections are in error. The office stated that Glezer et al. discloses a vibrator member "for vibrating the flexible membrane to cause a volume of the fluid chamber to periodically increase and decrease with the decrease in volume of the fluid chamber simultaneously expelling a fluid vortex (34) from the aperture". A reference to Figures 1A, 1B and 1C of Glezer et al. shows a single aperture with a single chamber and a reference to Figure 15A and 15B of Glezer et al. shows two apertures with each having a separate chamber. Thus Glezer et al. has a chamber for each of his apertures.

In contrast, applicants independent claim 1 calls for "a plurality of spaced apertures" and further points out "the flexible membrane and the housing forming a fluid chamber". Claim 1 goes on to point out the vibration of the membrane results in the "fluid chamber simultaneously expelling a fluid vortex from each of the plurality of space apertures". (emphasis added). In contrast to the single chamber of applicant Glezer has a separate chambers 194 (see Figure 15A) for each of his apertures, he does not form a chamber as called for in claim 1, i.e. a chamber that can expel a fluid vortex from each of the plurality of spaced apertures.

A reference to pages 13 line 16 - to page 14 line 28 and to Figures 5-7 illustrate what applicant achieves with a plurality of spaced apertures in communication with a single chamber that expels a fluid torous through each of the plurality of apertures; namely a coalescing effect of the toruses that are emanating from each of the spaced apart apertures. This effect is illustrated in the drawings. Figures 5, Figure 6 and Figure 7 show how each of toruses that are ejected from separate apertures meet and coalesces into a larger torus to produce the fan. This feature of the coalescing toruses is not shown or taught in Glezer et al.

Accordingly, it is requested that the office withdraw the rejection of claim 1 and its dependent claims 2-9 under 35 U.S. 102 since Glezer fails to disclose plurality of apertures with a chamber that simultaneously produce vortexes to coalesce with each other to generate a single vortex.

In regard to method claim 17 and its dependent claims 18-25 it is likewise pointed out that claim 17 calls for a "plurality of radially expanding fluid torus shaped vortexes" that "expand into an adjacent radially expanding fluid torus shaped vortex" to produce a "single composite radially expanding torus shaped vortex". This feature is not disclosed or taught by Glezer et al.

Accordingly, it is submitted that independent claim 17 and dependent claims 18-25 are also allowable.

The rejection of independent claim 10 and dependent claim 11, 12, 13, 14, 15 under 35 U.S.C. 102 and the simultaneous rejection of independent claim 10 under 35 U.S. C. 103.

It is submitted both of the rejections under 102 and 103 are in error. More specifically, the rejection of, claim 10 under 35 U.S.C. 102 is in error as the claim 10 calls for a vibrator comprising "a rotatable offset weight" which is not shown in Glezer et al. This point is confirmed by the office comments on page 4 paragraph 4 in the rejection of claims 5, 10 and 20 where the office states that Glezer "does not disclose it as being an eccentric rotating weight" (i.e. the vibrator). Accordingly, it is submitted the rejection of independent claim 10 and depend claims 11-16 under 35 U.S.C. 102 is in error.

The rejection of claims 5, 10 and 20 under 35 U.S. C. 103 on the combination of Glezer and Fusaro

The office contended that it would be obvious to use the vibrator of Fusaro (found in US. class 219/121.47) with the Glezer device of class 239/4. It is submitted that one in the art of generation fluid pulses in the shape of fluid torous would not look to the art of dislodging solid material from

a hopper used in underwater welding to produce a membrane that generates a fluid torous. Glezer teaches the formation of a torus by flexing his membrane, he does not have solid material thereon that he wishes to dislodge as taught by Fusaro.

Accordingly, it is submitted the rejection of claims 5, 10, and 20 under 35 U.S. C. 103 is in error since the teaching of Fusaro is for dislodging solid material from a hopper used in underwater welding and that Glezer et al. does not even have a hopper nor does he have solid material that needs to be dislodged nor is the art of generating fluid torus related to the art of underwater welding.

The dependent claims 2, 8, 16 (of claim 1) and the dependent claims 18 and 22 (of independent claim 17) were rejected as being unpatentable under 35 U.S.C. 103(a) as being unpatentable by Glezer et al. 823.

The office stated on page 4 that Glezer "does not disclose that the flow expelled from the apertures as being laminar" but that it "would have been obvious mater of design choice to a person of ordinary skill in the art to produce a laminar flow condition". The office then went on to state that "applicant has not disclosed that laminar flow provides an advantage or solves any stated problem". The applicant traverses such statement. A reference to page 11 lines 15 to 19 where applicant points the effect of laminar vs. turbulent flow:

" The frequency of the output of the torus shaped vortices is limited by the need to maintain a laminar flow of fluid through the orifice in both directions. Should the flow of fluid be allowed to become turbulent, which generally occur with a Reynolds Number exceeding 2000, the flat fan system will lose effectiveness as vortex formation is limited with a disturbed fluid environment"

It is submitted that applicant does disclose the benefit of laminar vs. turbulent flow.

The office went on to state that the applicant does not disclose any structure to produce laminar flow. It is submitted that the structure to produce the laminar flow is the flexible member and the

vibrator member. It is further pointed out that laminar flow is a condition of the internal forces in a fluid.

In regard to the rejection under 35 U.S. C. 103 that it would be obvious to use laminar flow as opposed to turbulent flow. Glezer does not teach the coalescing of the fluid to produce the flat fan effect. It is submitted that if Glezer does not teach or recognizing the coalescing of the multiple vortices Glezer has also failed to recognize that to coalesce the vortices to obtain the effective fan effect (as illustrated in Figures 5-7) one needs to generate laminar flow. Withdrawal of the rejection of claims 2, 8, 16, 18 and 22 is requested.

Dependent claim 5 (of independent claim 1) and independent claim 10, and its dependent claim 20 were rejected under 35 U.S.C. 103(a) as being unpatentable over Glezer et al. 823 in view of Fusaro, Jr. et al.

The office stated that Glezer discloses that the "vibrator can be any suitable device but does not disclose it as being an eccentric rotating weight". Applicant agrees that Glezer states it can be any suitable device. However the scope of, the suitable devices described by Glezer are all non mechanical and are all direct displacement devices.

The office's attention is called to the following description of his control device 24:

On column 10 lines 63 Glezer states they could be "piezoelectric devices" or "electrostatic device"

On column 11 line 48 Glezer refers to a "piezoelectric transducer"

On column 14 lines 52-4 Glezer refers to a "metal electrode" moved via "an electrical bias"

On column 19 lines 60-65 Glezer refers to "fluid actuators" "synthetic jets" piezoelectric actuators" "conventional pulsed jets", "moving flaps" and "electromechanical actuators" (speakers) and "ultrasonic devices"

On column 22 lines 8-10 Glezer refers to "either electrostatic or piezoelectric actuation"

On column 24 lines 10- 20 Glezer refers to use of "commercial piezoelectric transducer" ,
"sinusoidal drive voltage"

Thus the office is correct in that Glezer does not disclose a rotating weight; however, the scope and type of the devices Glezer discloses teach away from a rotating offset weight since Glezer's multitude of suggestions are either dependent on a variation in an electrical signal, a pulsed jet or a moving flap. Even though Glezer has sought to prepare a laundry list of different types of devices to control his membrane he fails to recognize that one can does not have to directly drive the membrane but one can use a small amount of energy to produce vibration of the membrane. More specifically, the applicant states on page 16 lines 4-10 that:

"A vibrator member comprises a dc motor with an offset or eccentric weight secured to the shaft of the dc motor provides an ideal vibrator source since a small amount of energy is required to produce the necessary vibrations to drive the membrane in a back and forth manner to force the fluid out of chamber and to draw fluid into chamber"

Glezer fails to recognize that use of a rotating weight can provide an improved means of vibrating the membrane since a small amount of energy is required to rotate the offset weight.

Accordingly, it submitted that Glezer teaches away from applicants invention of using a rotating weight as evidence by the multiple devices Glezer suggests, none of which recognize an indirect method membrane movement using a rotating weight.

The remaining dependent claims 19 and 25 (of independent claim 17) were rejected under 35 U.S.C. 103(a) as being unpatentable over Glezer et al. 823 in view of Rhyne et al.

The office contented that Rhyne discloses that "it is old and known to provide a curved lip in order to produce a venturi effect". Applicant submits the issue is not whether a curved lip can produce a venturi effect but whether it would be obvious to use a venturi in the device of Glezer.

A review of the Glezer patent discloses that he uses an abrupt angled orifice 90 degree turn to produce the "Coanda effect" as a result a small stream of fluid can turn a larger stream. This is shown in his Figure 2E. Thus, Glezer teaches one not to form vortices that can coalesce but teaches one to use the "Coanda effect" to form an amplifier to transfer his emitting fluid stream from one direction to another direction. In summary, there is no reason why Glezer would want to destroy the Coanda effect and his amplifier by forming a venturi throat.

The objection to Claim 11 because the drawings did not show concentrically arranged apertures.

Applicant submits that the concentrically arranged apertures are shown in the drawings. Note that Figure 3 shows a top view of the concentrically arranged apertures which are described as concentric arranged apertures. A section line 4-4 extends across Figure 3 and results in the partial sectional view shown in Figure 5, Figure 6, and Figure 7. It is submitted that Figure 3 alone shows the concentric aperture arrangement and that Figures 4, 5 and 6 further support the concentric arranged apertures. In addition, the specification on page 12 lines 26-27 in referring to array plate 40 states the " By positioning of number of apertures in the array plate in a concentrically; spaced arrangement" . It is submitted the basis for claim 11 is present in the specification.

Accordingly, withdrawal of the objection to lack of basis for concentrically spaced apertures is requested.

Respectfully submitted,

JACOBSON AND JOHNSON

By 

Carl L. Johnson, Reg. No. 24,273

Attorneys for applicant

Suite 285

One West Water Street

St. Paul, Minnesota 55107-2080

Telephone: 651- 222-3775